

Appl. No. 09/520,249
Amdt. dated December 19, 2005
Reply to Office Action of September 27, 2005

Docket No. 99-009

REMARKS / ARGUMENTS

Claims 32-44 remain in this application. Claims 1-31 are canceled, without prejudice.

In the above-identified Office Action, the Examiner allowed claims 33-35 and 42-44.

Summary of Telephonic Interview

On November 23, 2005, the undersigned agent discussed the present application with Examiner Cain by telephone. The issue was discussed regarding of the form of the additive and the form of the matrix PVC resin at the time the additive and the PVC are combined. Also discussed was the issue of whether the product of the process of the presently claimed invention has unexpected benefits over any products that might be known in the prior art that are produced by previously known processes and that have composition similar to that of the product made by the process of the presently claimed invention.

Response to rejection of claim 32 over GB '185

In the above-identified Office Action the Examiner rejected claims 32 and 35-39 under 35 USC §102(b) as being anticipated by GB 1,230,185 ("GB'185"). The Examiner stated, "The compositions are taught as prepared by blending the latex with the polyvinyl chloride."

GB'185 discloses methods of blending PVC with additive on p. 3, lines 15-23. As Applicants set forth in the Amendment of June 29, 2005, those of ordinary skill in the art understand the teachings of GB'185 to disclose two methods of blending PVC with additive:

- 1) blending additive in powder form with PVC in powder form, or "alternatively"
- 2) blending additive in latex form with PVC in a form that is not slurry, wetcake, or powder.

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The conclusion that the teachings of GB'185 are limited to these two methods of blending is set forth in greater detail in the declaration by Dr. Jane E. Weier, submitted herewith. Thus, GB'185 does not teach blending of additive in latex form with PVC that is in the form of slurry, wetcake, or powder.

In contrast, present claim 32 recites blends of PVC and additive that are made by blending additive in aqueous form with PVC in the form of slurry, wetcake, or powder. Therefore, Applicants submit that the blends recited in present claim 32 are not taught or suggested by GB'185.

Additionally, Applicants submit that the present specification provides evidence demonstrating that the compositions recited in present claim 32 have unexpected benefits over corresponding previously known compositions (i.e., compositions that have similar ingredients to those recited in present claim 32 and that were made by previously known processes). In the present specification, compositions of the present invention were shown to have improved impact resistance in three cases, and improved melt properties in two cases, over corresponding previously known compositions, as set forth in detail below.

In the present specification, Examples 1a and 1b are impact modifiers with butyl acrylate (BA) core and methyl methacrylate (MMA) shell (see p. 21-22). The latex forms are designated "1a" and "1b," and the dried powder forms of these latexes are designated "1ap" and "1bp" (see the last line of p. 22).

In Table 3, Izod impact data are given for the impact behaviour of samples of PVC modified with 1a or 1ap, tested at various temperatures. In the test reported in Table 3, "ductile" samples are those that resist impact well; they absorb relatively large amounts of energy from the impact device; they deform under the impact energy but do not fly apart in pieces. It is well known to those of ordinary skill in the art that the alternative to "ductile" behavior is "brittle" behavior, in which the sample snaps apart readily and absorbs relatively low impact energy. At the lowest temperature, 15°C, resins have the strongest tendency to behave in brittle fashion, and the difference between the compositions becomes most apparent. The PVC samples modified with 1a remained

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mostly ductile at 15°C, while PVC samples modified with 1ap became mostly brittle, showing that 1a imparts improved impact resistance over that imparted by 1ap.

As a second impact resistance example, Table 4 shows that PVC modified with 1b (latex form of another BA/MMA impact modifier) has better ductility and higher impact energy in Izod impact than does PVC modified with 1bp (the powder form or 1b).

As a third impact resistance example, Table 9 shows Gardner impact test results. In this test, the higher impact energies (in J/m) at both the center and the right side of the test sheet show that 1a imparts better impact resistance than does 1ap.

Compositions of the present invention also impart improved melt flow properties to PVC resin formulations. These improved melt flow properties have the benefit of more efficient manufacturing operations or higher output or both. For example, Table 9 also shows that PVC modified with 1a has a lower power draw in the extruder than does PVC modified with 1ap. As another example, Table 14 shows that PVC modified with 1a has a lower fusion time than PVC modified with 1ap (see samples "B" and "C" in Table 14).

In sum, when compositions of the present invention are compared to corresponding previously known compositions, the performance of the compositions of the present invention is either equivalent or improved. Therefore, there is a net benefit to using compositions of the present invention. Those of ordinary skill in the art would have expected the performance to be based on the ingredients of the compositions and not on the method of blending them, and so the improvements due to the present invention are unexpected.

Response to rejection of claim 40 over GB '185 and Ludwig

In the above-identified Office Action the Examiner rejected claim 40 under 35 USC §103(a) as being obvious over GB'185 in view of US 5,780,549 ("Ludwig"). The Examiner stated that it would have been obvious to "incorporate common adjuvants as taught by the secondary reference into the composition of the primary reference."

As discussed herein above and in their Amendment of June 29, 2005, Applicants submit that the additive-plus-resin compositions recited in currently amended claim 32

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are not taught by the primary reference (i.e., GB'185). The teachings of Ludwig regarding additional adjuvants do not address the differences between the additive-plus-resin compositions of currently amended claim 32 and the additive-plus-resin compositions taught by GB'185. Therefore, Applicants submit that present claim 40 is not obvious over GB'185 in view of Ludwig.

Claims 35-39 and 41-44

Present claims 36-41 are dependent on currently amended claim 32. Applicant has argued herein above that currently amended claim 32 is novel over GB'185, and so Applicant further submits that present claims 36-41 are also novel over GB'185.

Conclusion

In view of the foregoing amendments and arguments, Applicants respectfully request the Examiner to reexamine the claimed subject matter, to withdraw the rejections of the claimed subject matter and to allow claims 32-44 at this time. If, however, there remain any open issues which the Examiner believes can be resolved by a telephone call, the Examiner is cordially invited to contact the undersigned agent.

No fees are believed to be due in connection with the submission of this amendment; however, if any such fees, including petition or extension fees, are due, the Commissioner is hereby authorized to charge them, as well as to credit any overpayments, to Deposit Account No. 18-1850.

Respectfully Submitted,



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